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MAP, FIG 1 + SITE PHOTOGRAPHS



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December 10, 2003

Mr. Ken Bardo  
RCRA Division  
U. S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

**Solutia Inc.**

W.G. Krummrich Plant  
500 Monsanto Avenue  
Sauget, Illinois 62206-1198  
Tel 618-271-5835

**Re: Augmentation of Gravel Thickness  
CA 725 Current Human Exposures Environmental Indicator  
Solutia W. G. Krummrich Plant  
Sauget, Illinois**

Dear Mr. Bardo:

On August 14, 2003, Solutia submitted a report to you that contained an evaluation of the current human exposures at the Solutia W. G. Krummrich Plant in Sauget, Illinois. This report concluded that in order to preclude dermal contact with potentially impacted surficial soils, at least 12 inches of gravel were required in those areas of the plant that are currently covered by gravel. On October 13, 2003, we submitted a map showing the areas on the plant site that required the addition of gravel to satisfy this requirement.

Attached to this letter are three copies of a report that describes the placement of the additional gravel and includes the results of thickness verification testing carried out after placement. That verification sampling confirmed that a minimum of 12 inches of gravel was present in each of the 13 areas that required additional material.

It is our belief that this report provides the final piece of documentation that establishes that the Krummrich Plant satisfies the CA 725 Environmental Indicator. Please contact us if you have any questions about the attached information.

Sincerely,  
Solutia Inc.

Gary W. Vandiver  
Project Coordinator

cc: Nabil Fayoumi, USEPA  
Jim Moore, IEPA  
Gina Search, IEPA  
Sandra Bron, IEPA  
Bob Billman, URS

Cathy Bumb, Solutia  
Linda Tape, Husch & Eppenberger  
Richard Williams, Solutia  
Bruce Yare, Solutia

# SUMMARY REPORT

## GRAVEL ADDITION IMPLEMENTATION AND CONFIRMATION

SOLUTIA INC.  
W.G. KRUMMRICH FACILITY  
SAUGET, ILLINOIS

*Prepared for*  
Solutia Inc.  
500 Monsanto Avenue  
Sauget, Illinois 62206

December 10, 2003

**URS**

URS Corporation  
1001 Highland Plaza Drive West, Suite 300  
Saint Louis, MO 63110  
(314) 429-0100  
Project #21561197.00002

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Appendix A	Photographs of the Gravel Addition
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From November 3, 2003 through December 5, 2003, Solutia Inc. (Solutia) supplemented the gravel covered areas at its W.G. Krummrich facility (Facility) located in Sauget, Illinois. The addition was performed as part of the Resource Conservation and Recovery Act (RCRA) Human Health Environmental Indicators (HHEI) study being performed for the Facility. The addition specifically addressed the direct contact pathway for site workers coming in contact with surface soils. Gravel or an asphaltic concrete cover was added to 13 distinct areas of the main Facility property as shown on **Figure 1**. The 13 areas were defined based on a Surficial Gravel Thickness Survey Report performed by URS Corporation (URS) (URS, January 2003).

The findings of the survey were included in a report that contained the results of an evaluation of the current human exposures at the Facility. That report was submitted to the United States Environmental Protection Agency (USEPA) on August 14, 2003. Based on discussion of that report with the USEPA at a meeting on August 18, 2003, it was agreed that a gravel cover a minimum of 12 inches thick would be sufficient to break the pathway for exposure to surface soils. This thickness is judged to be sufficient to prevent incidental exposure to impacted soils as a result of routine activities such as rutting caused by heavy vehicles. The Toxic Substances Control Act (TSCA) regulations provide some relevant guidance in that a soil cap 10 inches thick is adequate to prevent exposure to PCB wastes (40 CFR §761.61(a)(7)).

Based on the survey, it was determined that the gravel thickness in 13 areas of the Facility was less than the required 12 inches and, accordingly, a design was proposed to supplement the gravel in these areas to ensure the minimum required thickness.

From November 3, 2003 through December 5, 2003, Philip Environmental Services Co. (PESC), on behalf of Solutia, performed the gravel addition at the facility. The work consisted of placing and compacting approximately 23,000 tons of crushed limestone (gravel) meeting the Illinois Department of Transportation Specification CA-10 (CA-10). Limestone screenings were used instead of CA-10 in a few of the 13 areas to provide a finer surface texture. Either CA-10 or the limestone screenings were used in the different areas to match the existing Facility surface covering. In addition in areas where it was unpractical to place the required thickness of gravel due to site conditions at the Facility (e.g., drainage or traffic) a minimum of three inches of asphaltic concrete was placed.

## **2.1 GRAVEL ADDITION**

Prior to gravel placement, existing ground surface elevations were obtained in each of the 13 areas to track during the placement of gravel to ensure that sufficient gravel was added to provide a minimum thickness of 12 inches.

The gravel placed by PESC was delivered to the site over the work period by Beelman Truck Co. in 40 feet end dump tractor-trailers. It was then spread with either John Deere 650H bulldozers, backhoes or bobcats, to provide the recommended thickness when compacted as described in the Surficial Gravel Thickness Survey Report (URS, January 2003). The gravel was compacted and was then final graded with a road grader and re-compacted. Compaction was achieved by a minimum of four passes with either a three-ton or a eight-ton vibratory roller on the gravel.

The recommended additional gravel thickness as described in the Surficial Gravel Thickness Survey Report was used as a basis for the gravel placement. In some instances, however, additional gravel was placed to fill in existing low spots in the topography or to retain current Facility drainage patterns. The gravel was tapered near railroad tracks and existing manholes (grated and closed) to avoid creating hazards or ponding.

## **2.2 ASPHALT PLACEMENT**

In some locations of Areas Three, Four, Six and Ten it was not practical to place the required thickness of gravel and a minimum of three inches of asphaltic concrete was placed instead. The asphalt was placed on November 26, 2003 by Sunrise Construction Inc. The asphaltic concrete was dumped and spread in a minimum three-inch lift over the existing gravel subgrade with an asphalt paver. It was then compacted with a smooth drum roller. Asphaltic concrete was placed to match existing finished asphalt or concrete.

### 2.3 CONFIRMATION SAMPLING AND RESULTS

Confirmation sampling was conducted to verify that a minimum of 12 inches of gravel cover was present in the 13 areas. The confirmation sampling points were chosen to verify locations of thin gravel as determined by the Surficial Gravel Thickness Survey Report (URS, January 2003), and additional points were chosen to provide good coverage across the 13 areas. Confirmation sampling points were located in the field by visually locating the points relative to Facility features and investigated by subsurface methods to confirm the approximate gravel thickness at these points. A total of 71 locations were evaluated to confirm the placement of a minimum of 12-inch gravel cover.

The subsurface investigation at the approximate location of each applicable sampling point was performed by the use of a hand-held rotary hammer utilizing a ½-inch diameter drill bit. The drill bit was advanced to the bottom of gravel, refusal or 12 inches below ground surface, whichever occurred first. The thickness of gravel at each boring location was measured and recorded. Each borehole was backfilled with the materials removed from the hole during drilling and the surface was smoothed to match surrounding grade.

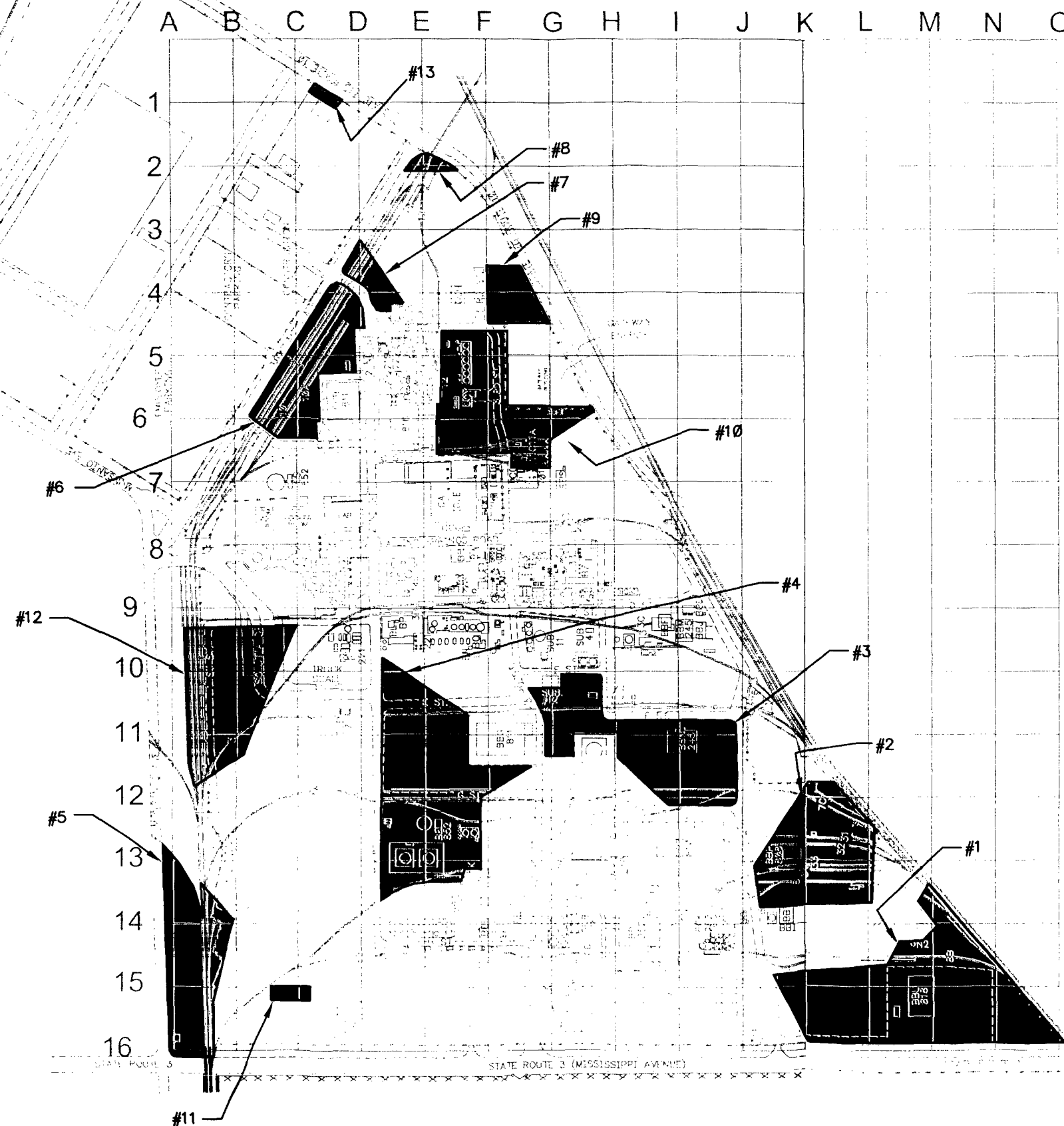
At two locations in Area 2 and Area 4, less than 12 inches of gravel was initially measured. In these two areas additional loads of gravel were placed to provide the minimum 12 inches of gravel cover. In some locations gravel was underlain by asphalt at a depth of 8-10 inches. The areas were excavated to confirm that the asphalt was a continuous layer under the gravel. **Figure 2 through Figure 14** show the confirmation sampling locations and existing surface conditions (e.g., gravel, concrete and buildings). Photographs of the gravel placement and completed gravel and asphalt surfaces are included in **Appendix A**.

The plant-wide gravel addition and asphaltic concrete placement at the Facility addresses the direct contact pathway for site workers with shallow soils as described in the CA-725. Gravel was added to the 13 distinct areas of the Facility as defined by the Survey performed by URS. Confirmation sampling in the areas verify a minimum of 12 inches of gravel cover by verifying old delineation points and using new delineation points to adequately characterize the areas.



Exposure to impacted soils at the main Facility property is not a complete pathway for site workers. For surface soils (<2 ft), ground cover materials prevent the potential for incidental contact and excavation is controlled by the excavation permit policy. A significant portion of the Facility is covered by relatively impermeable materials (e.g., asphalt, concrete, structures, etc) and the balance of the area is covered by a minimum of 12 inches of gravel and in some places up to 24 inches as defined by the Surficial Gravel Thickness Survey Report (URS, January 2003).



File: F:\21561197.00002\8-25-03\GRAVEL PLACEMENT REPORT FIG 1.DWG Last edited: DEC. 10. 03 @ 12:40 p.m. by: MJFORCHO



**LEGEND**

-  Boundary of area where gravel was previously measured less than 12 inches thick.
-  Areas that received gravel to achieve minimum 12 inch thickness.



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CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL  
SOLUTIA W.C. KRUMMRICH PLANT  
SAUGET, ILLINOIS

PROJECT NO.  
21561197.00002

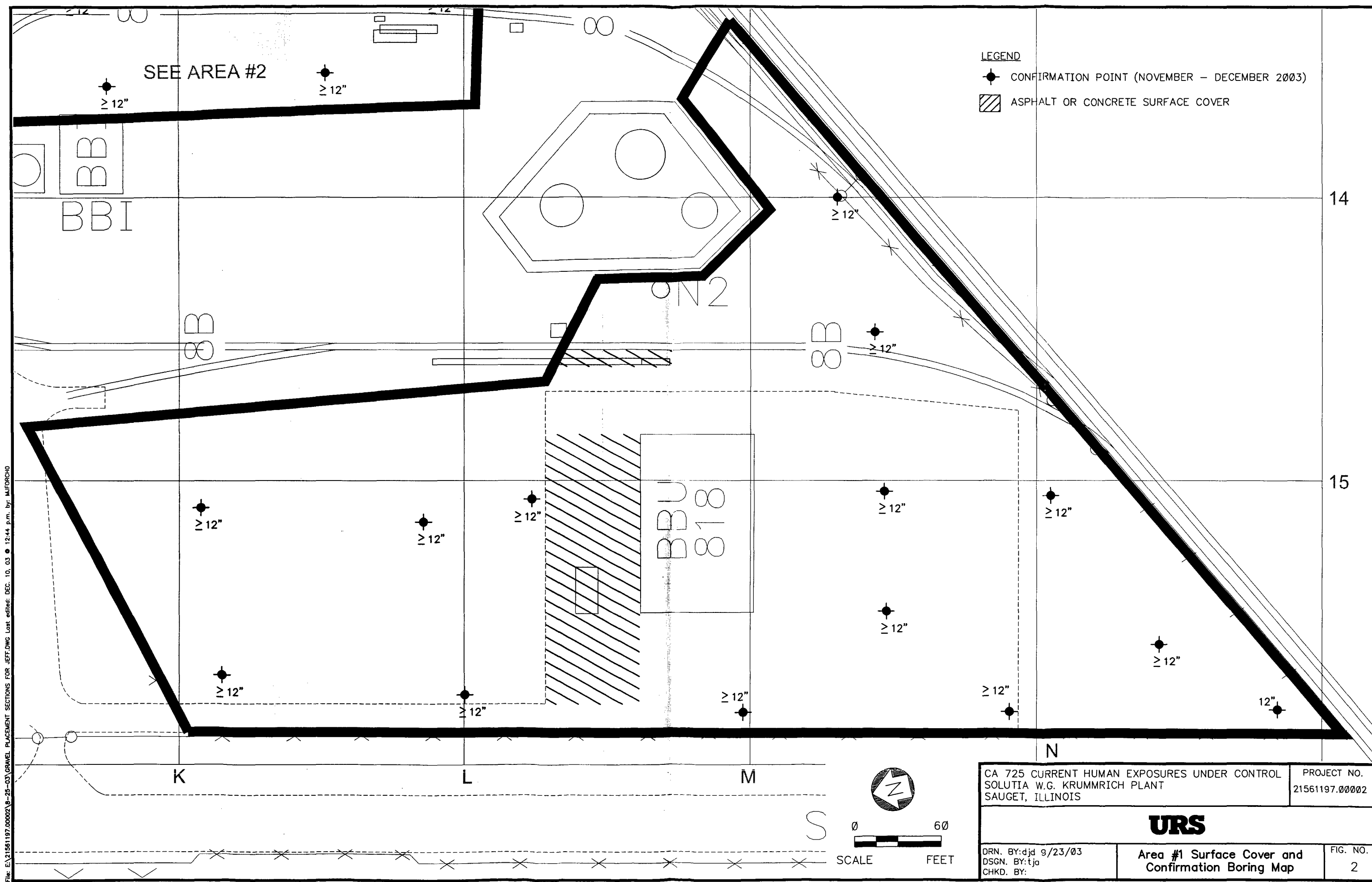
**URS**

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DSGN. BY: tja  
CHKD. BY:

Areas That Received Additional  
Gravel Placement

FIG. NO.  
1

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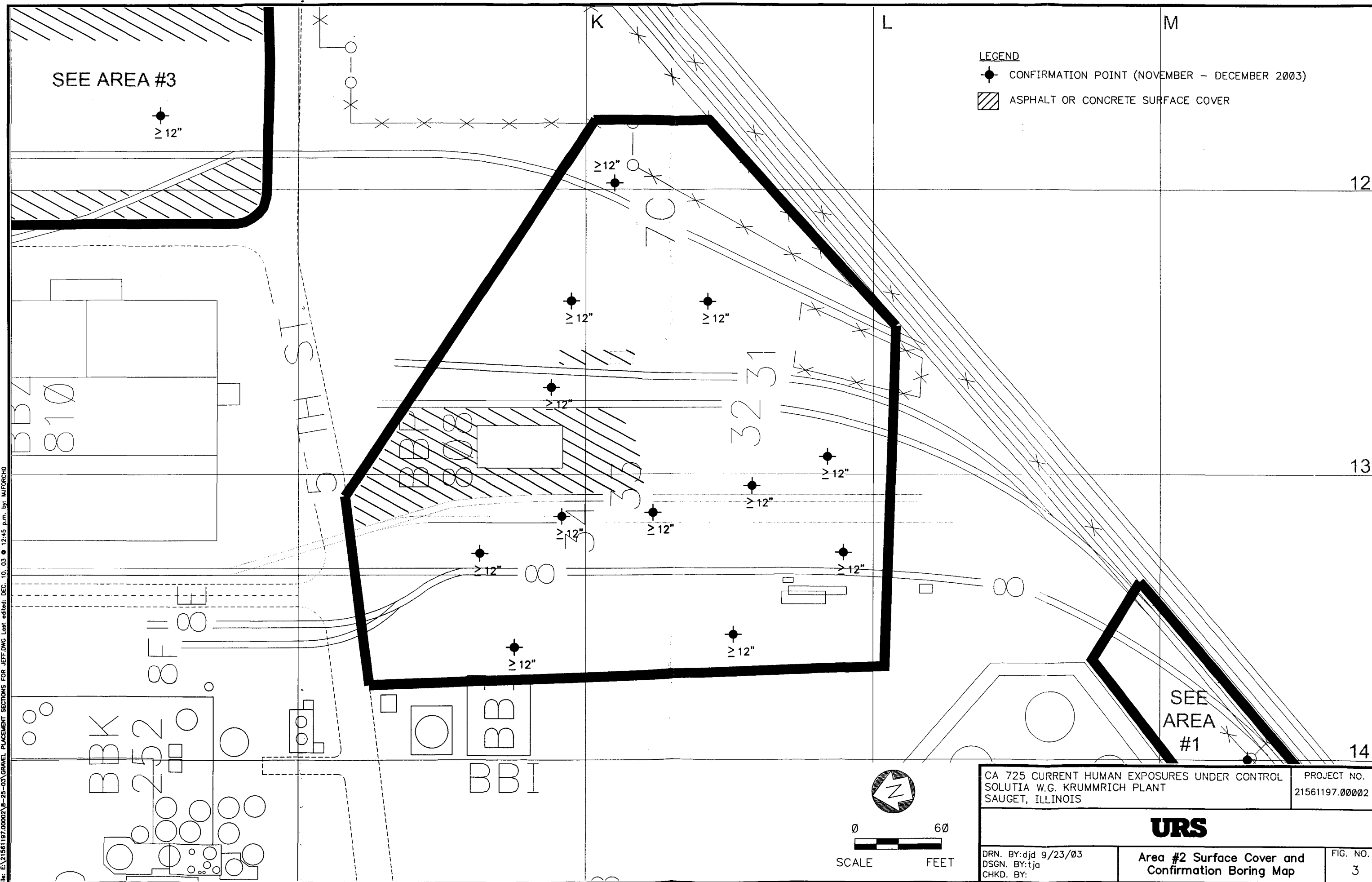


LEGEND  
★ CONFIRMATION POINT (NOVEMBER – DECEMBER 2003)  
[Hatched Box] ASPHALT OR CONCRETE SURFACE COVER

CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL SOLUTIA W.G. KRUMMRICH PLANT SAUGET, ILLINOIS	PROJECT NO. 21561197.00002
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<b>URS</b>	
DRN. BY: djd 9/23/03 DSGN. BY: tjo CHKD. BY:	Area #1 Surface Cover and Confirmation Boring Map
FIG. NO. 2	

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SAUGET, ILLINOIS

PROJECT NO.  
21561197.00002

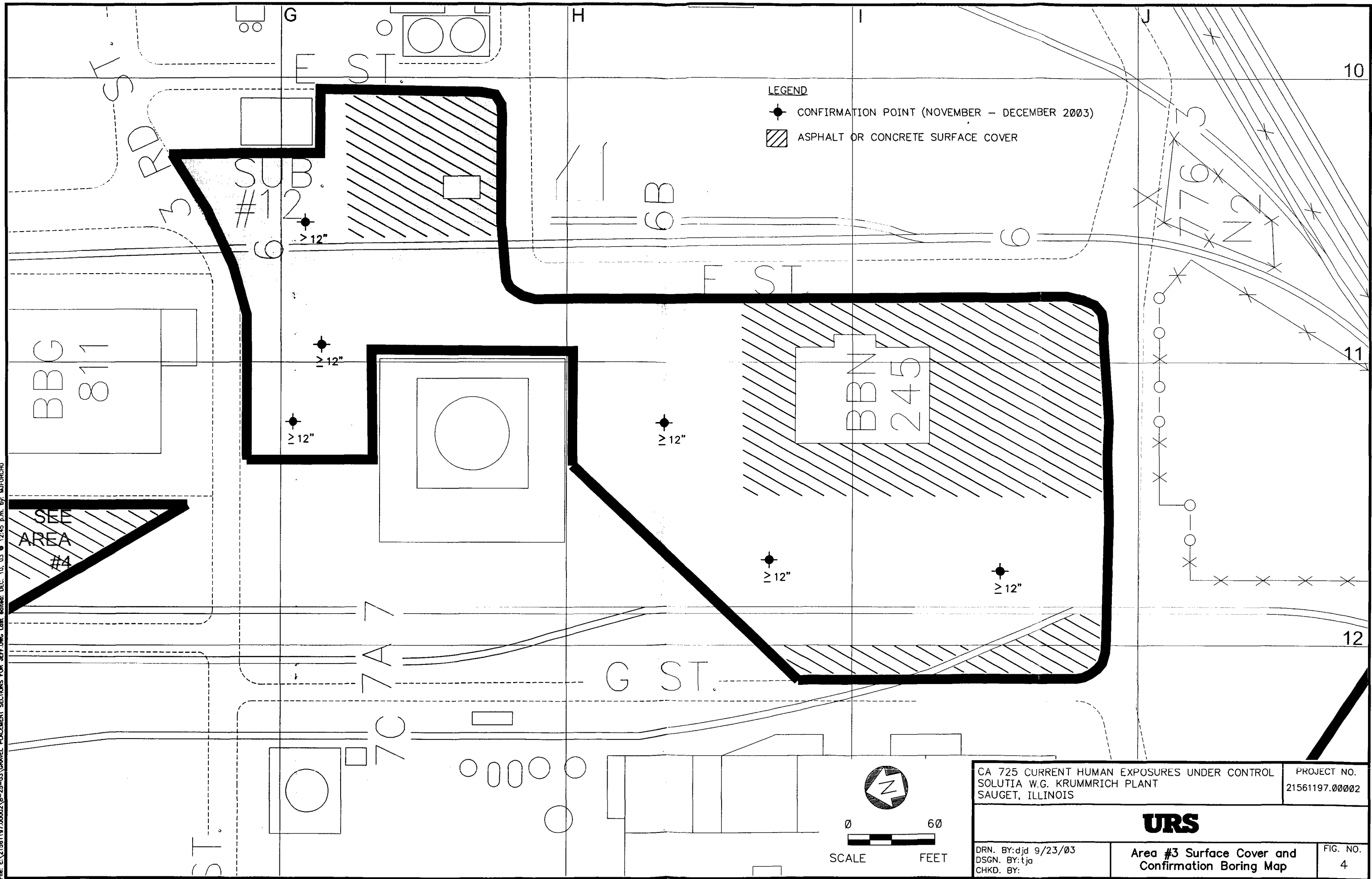
**URS**

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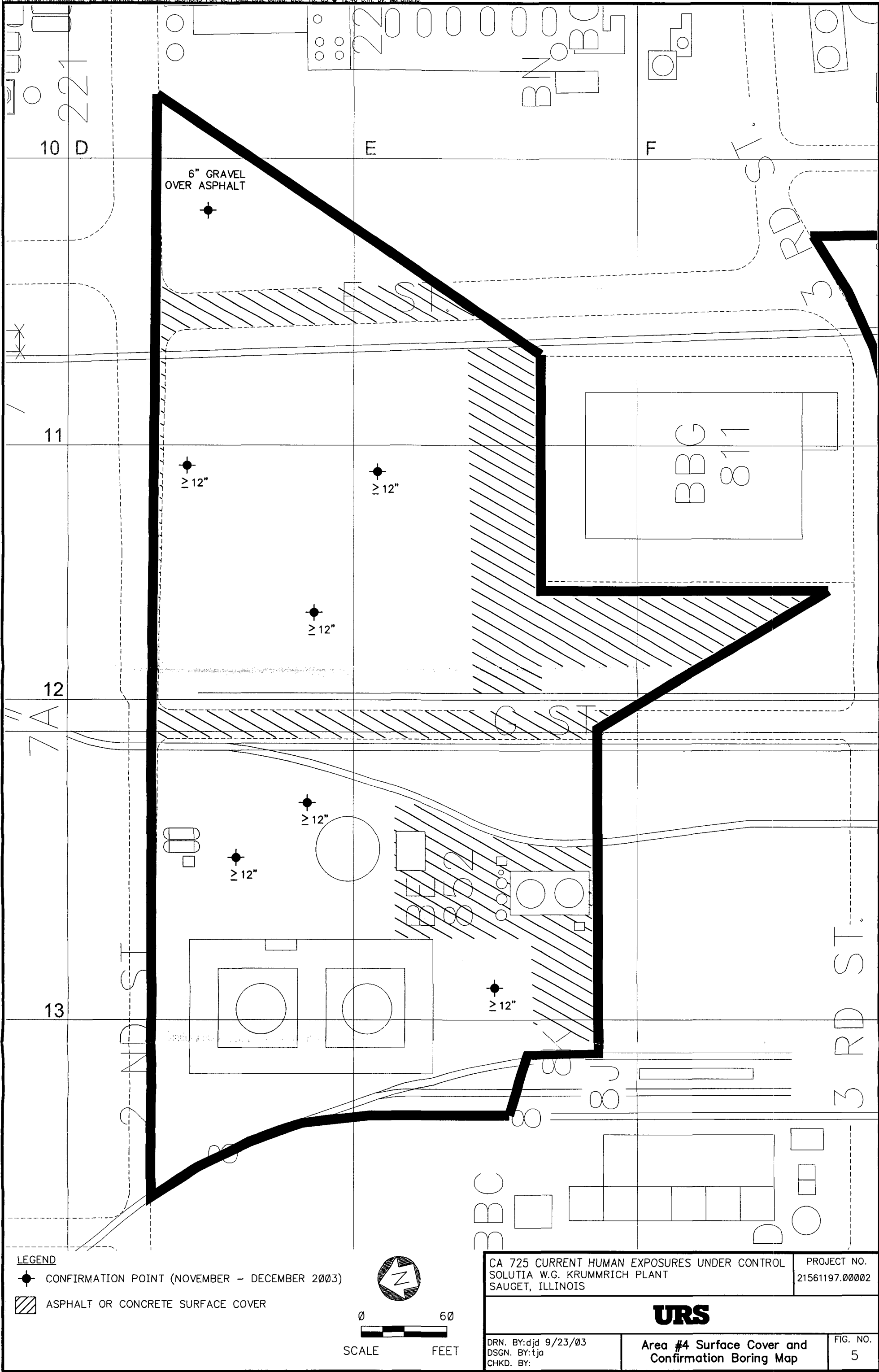
**Area #2 Surface Cover and  
Confirmation Boring Map**

FIG. NO.  
3

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<b>URS</b>		
DRN. BY: djd 9/23/03 DSGN. BY: tja CHKD. BY:	Area #3 Surface Cover and Confirmation Boring Map	FIG. NO. 4



LEGEND

- CONFIRMATION POINT (NOVEMBER - DECEMBER 2003)
- ASPHALT OR CONCRETE SURFACE COVER



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CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL  
SOLUTIA W.G. KRUMMRICH PLANT  
SAUGET, ILLINOIS

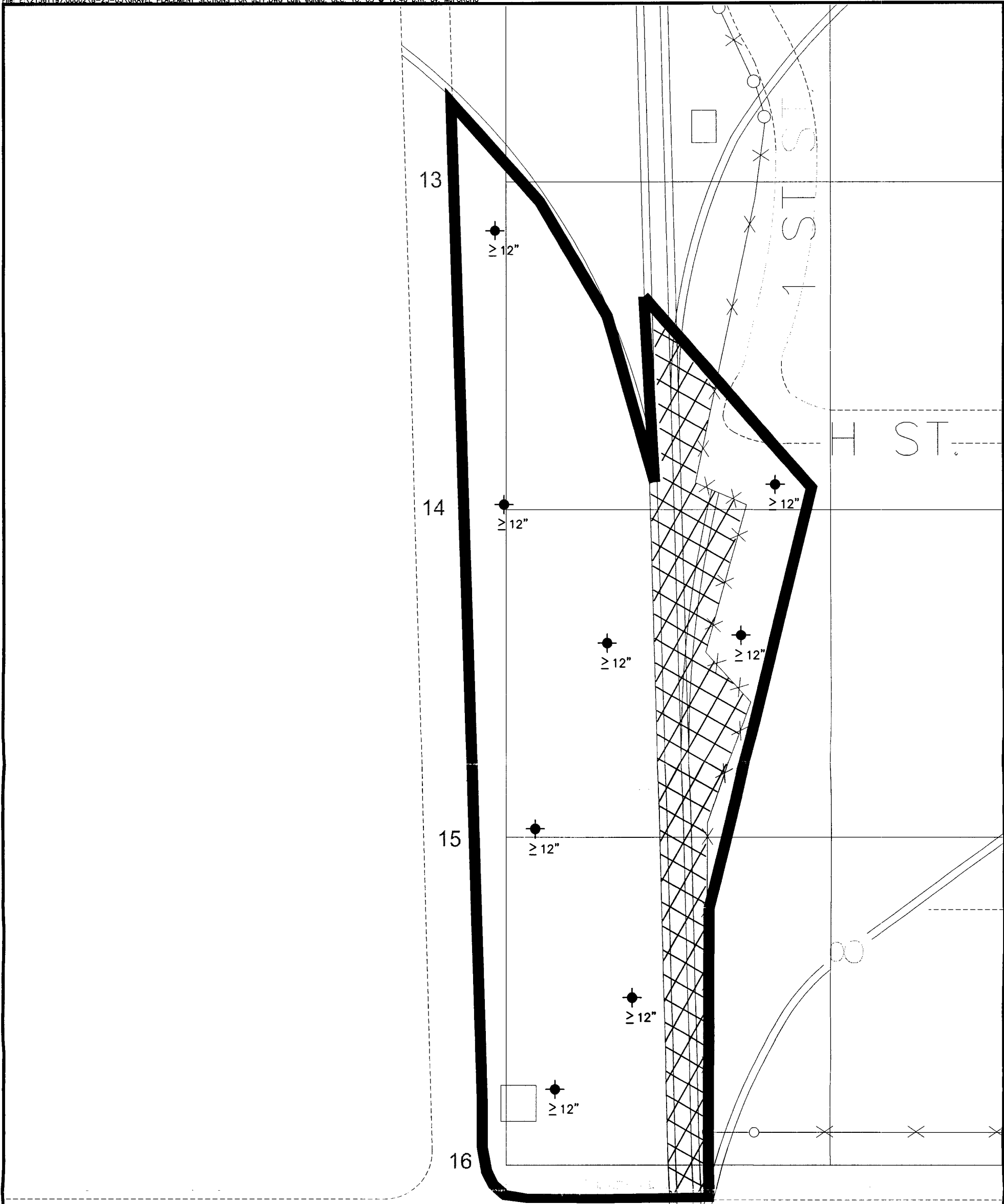
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Area #4 Surface Cover and  
Confirmation Boring Map

FIG. NO.  
5



LEGEND

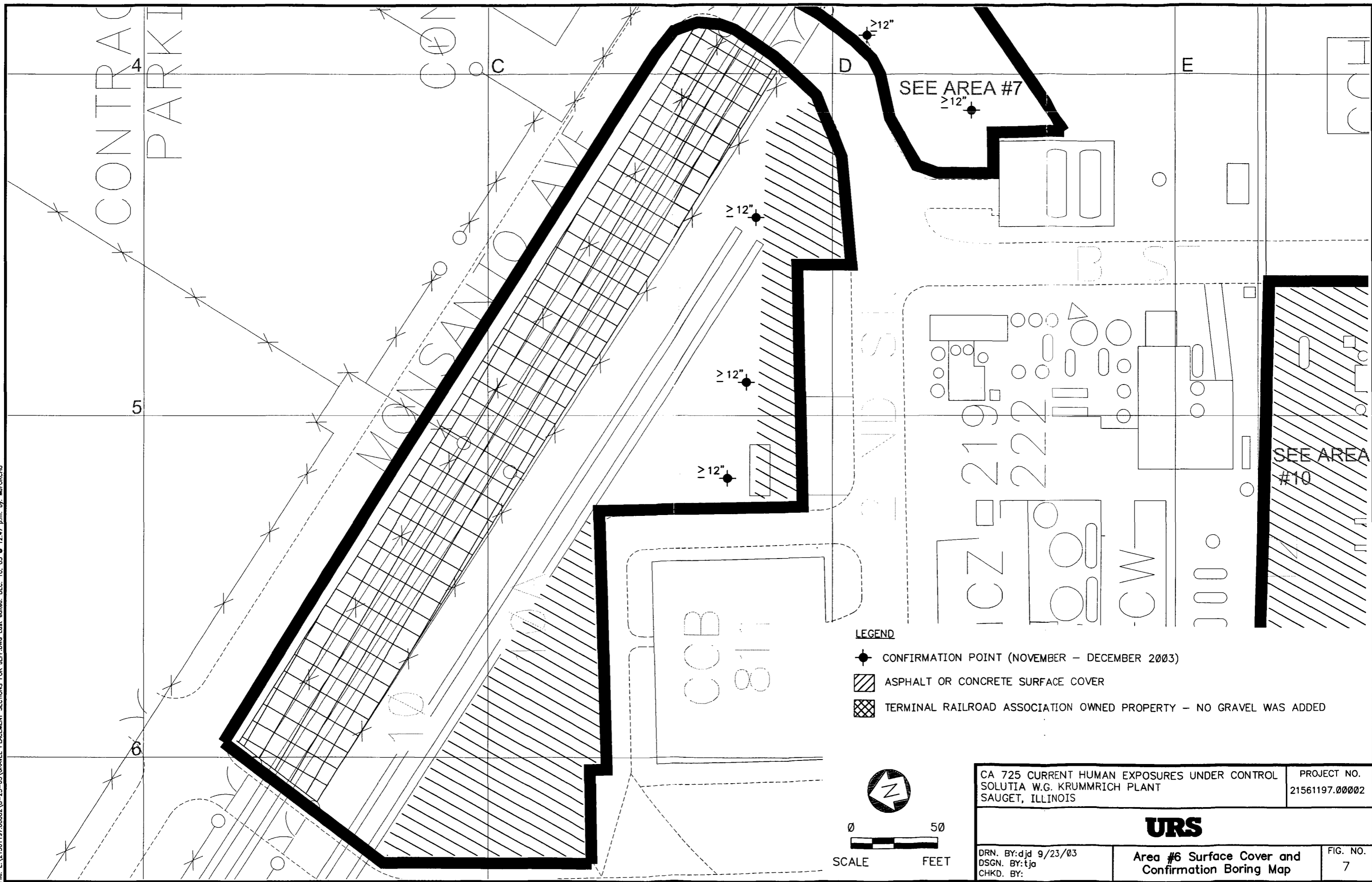
- CONFIRMATION POINT (NOVEMBER - DECEMBER 2003)
- TERMINAL RAILROAD ASSOCIATION OWNED PROPERTY - NO GRAVEL WAS ADDED



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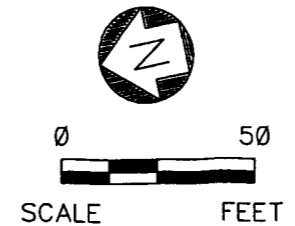
CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL SOLUTIA W.G. KRUMMRICH PLANT SAUGET, ILLINOIS		PROJECT NO. 21561197.00002
URS		
DRN. BY:djd 9/23/03 DSGN. BY:tja CHKD. BY:	Area #5 Surface Cover and Confirmation Boring Map	FIG. NO. 6

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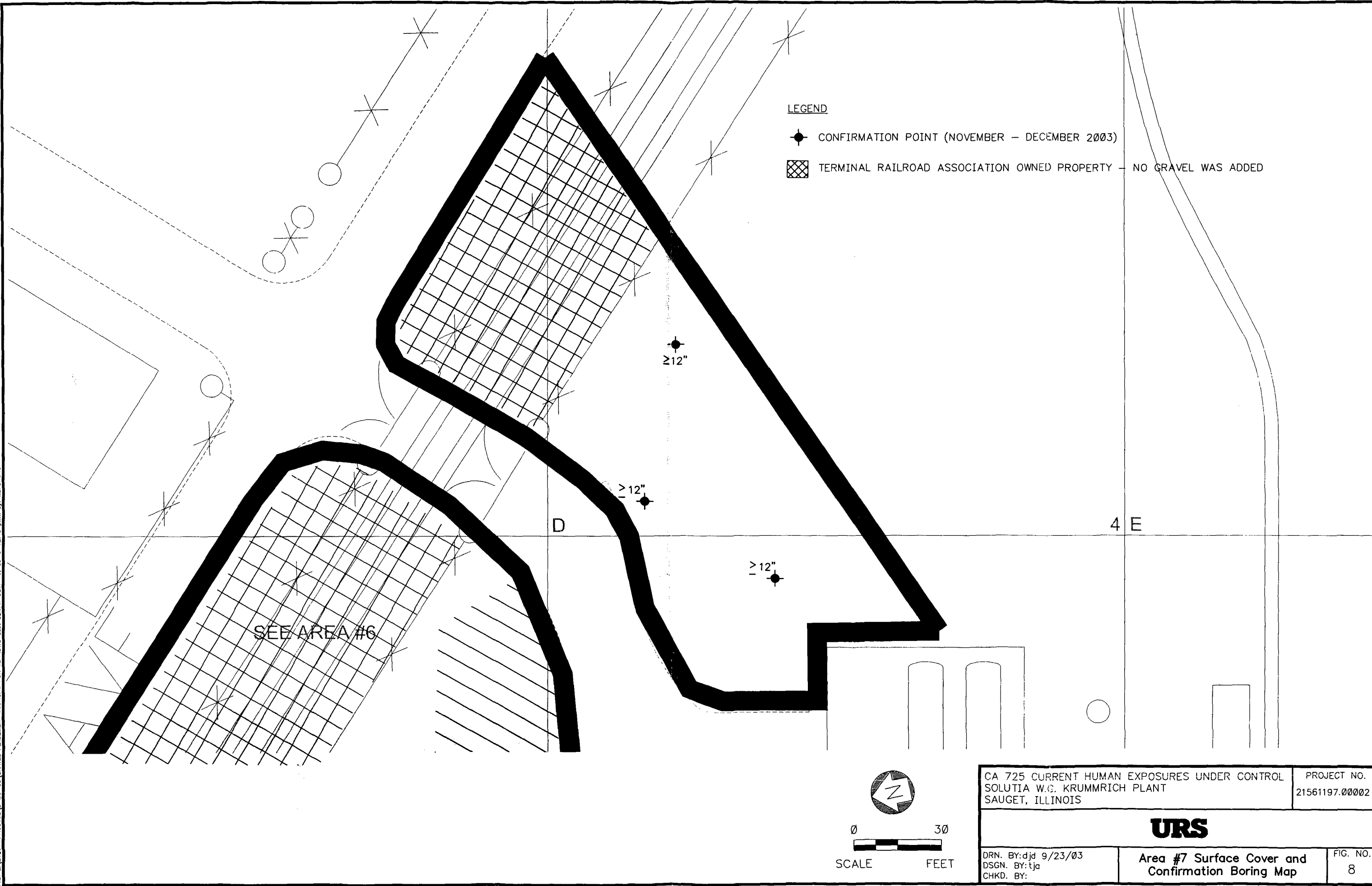
LEGEND

- CONFIRMATION POINT (NOVEMBER - DECEMBER 2003)
- ▨ ASPHALT OR CONCRETE SURFACE COVER
- ▩ TERMINAL RAILROAD ASSOCIATION OWNED PROPERTY - NO GRAVEL WAS ADDED



CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL SOLUTIA W.G. KRUMMRICH PLANT SAUGET, ILLINOIS		PROJECT NO. 21561197.00002
<b>URS</b>		
DRN. BY:djd 9/23/03 DSGN. BY:tja CHKD. BY:	Area #6 Surface Cover and Confirmation Boring Map	FIG. NO. 7

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- CONFIRMATION POINT (NOVEMBER – DECEMBER 2003)
- TERMINAL RAILROAD ASSOCIATION OWNED PROPERTY – NO GRAVEL WAS ADDED



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CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL  
SOLUTIA W.C. KRUMMRICH PLANT  
SAUGET, ILLINOIS

PROJECT NO.  
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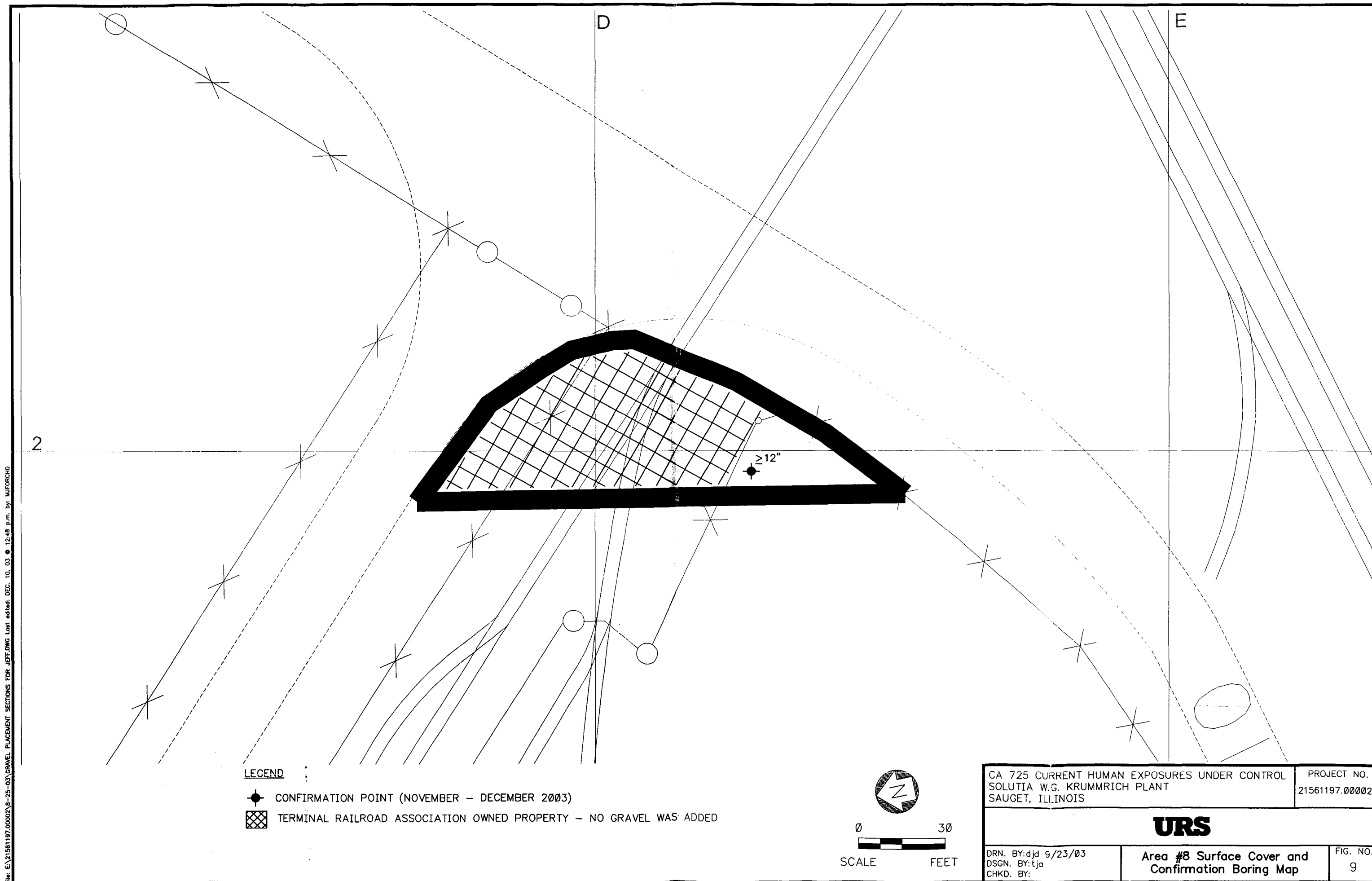
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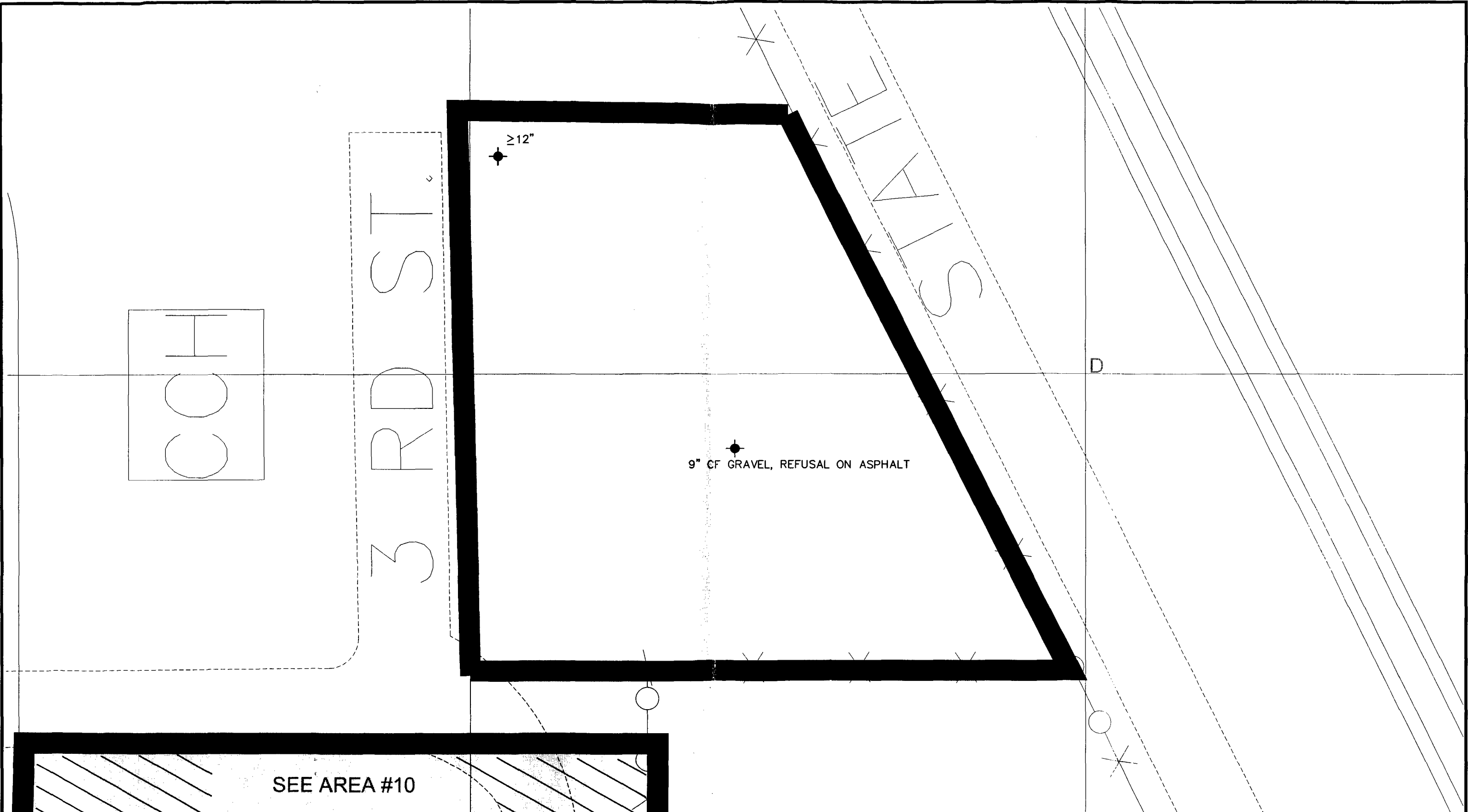
Area #7 Surface Cover and  
Confirmation Boring Map

FIG. NO.  
8

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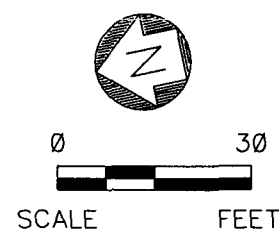


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✦ CONFIRMATION POINT (NOVEMBER – DECEMBER 2003)



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SOLUTIA W.G. KRUMMRICH PLANT  
SAUGET, ILLINOIS

PROJECT NO.  
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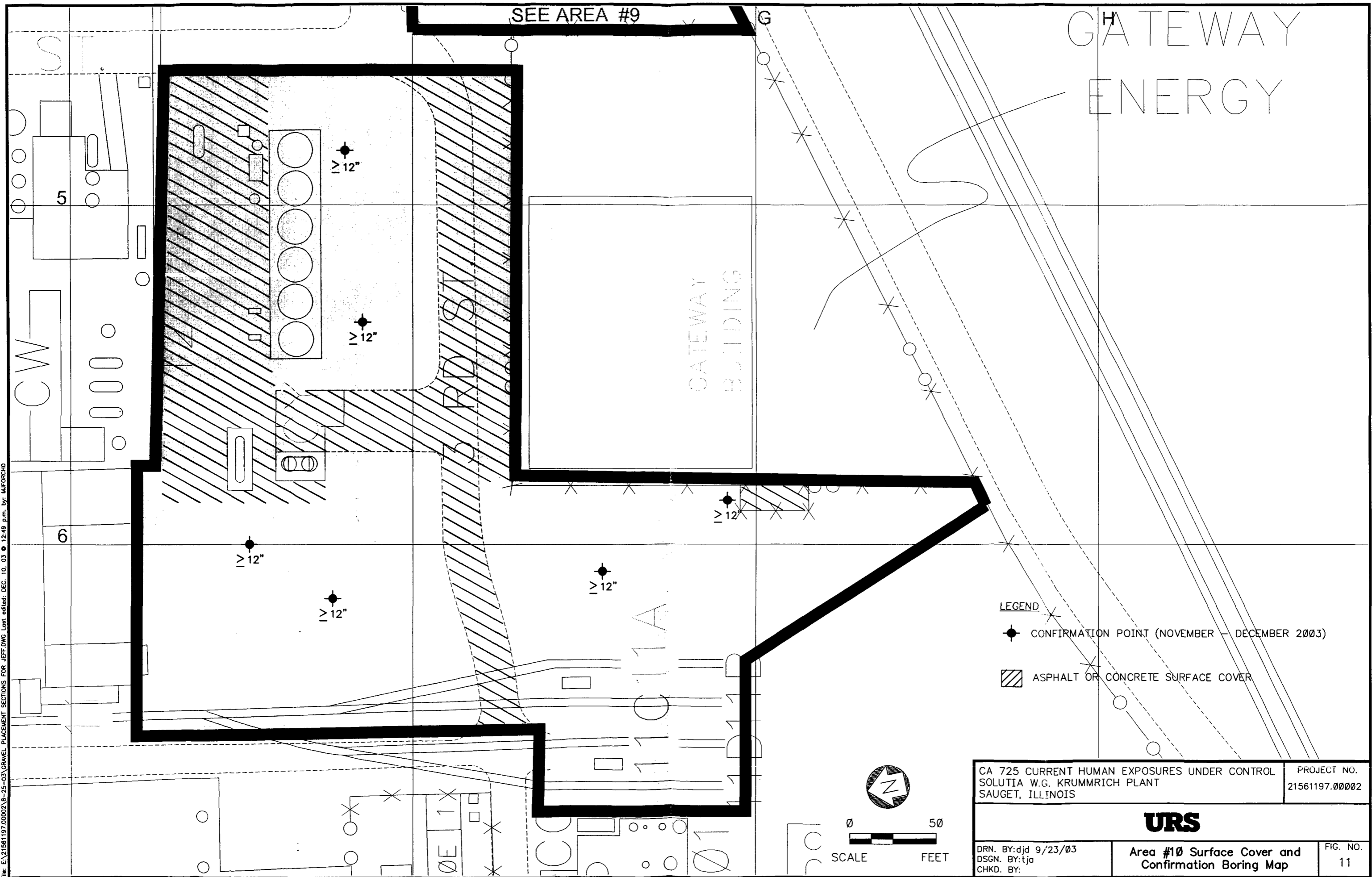
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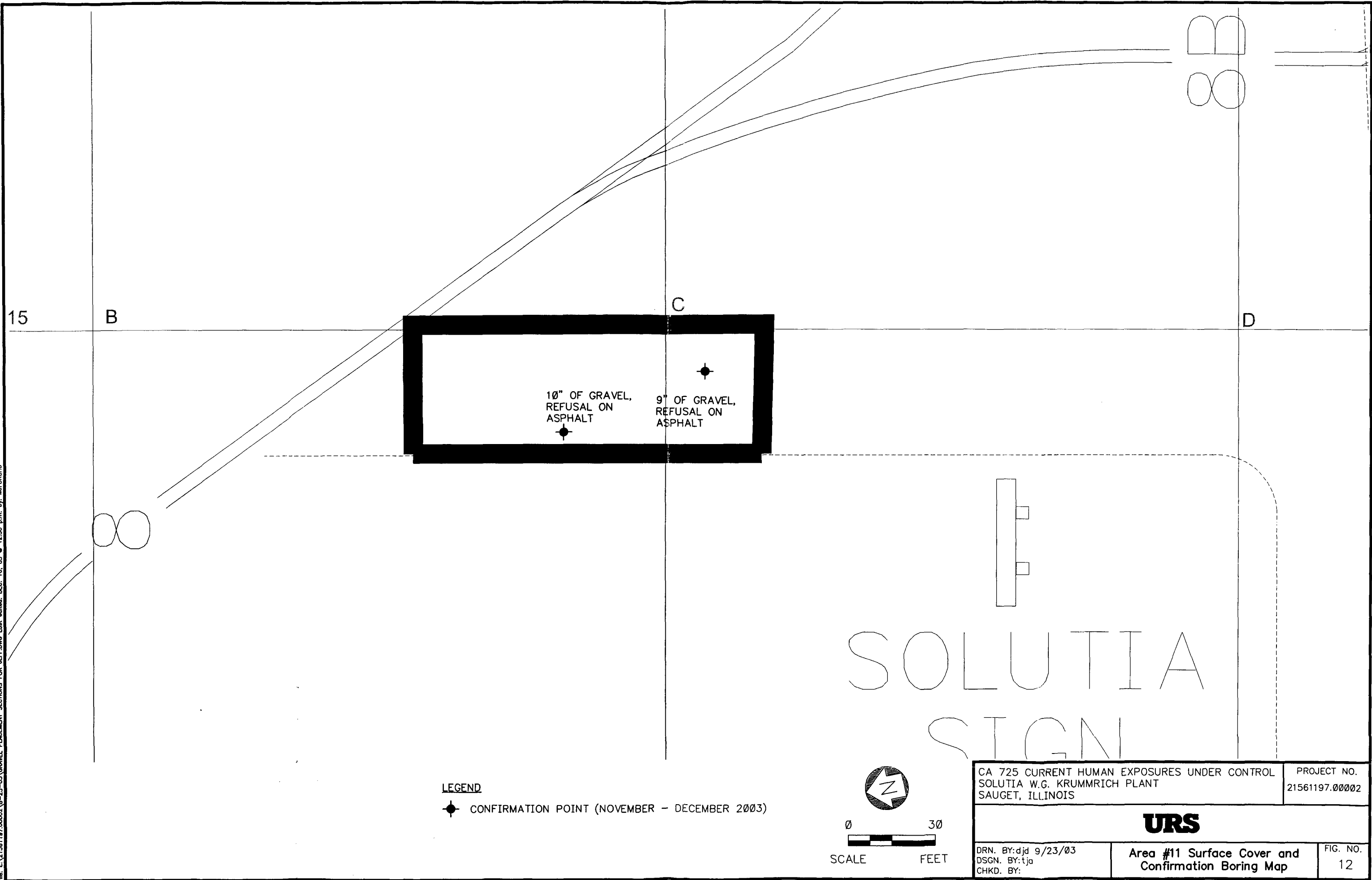
Area #9 Surface Cover and  
Confirmation Boring Map

FIG. NO.  
10

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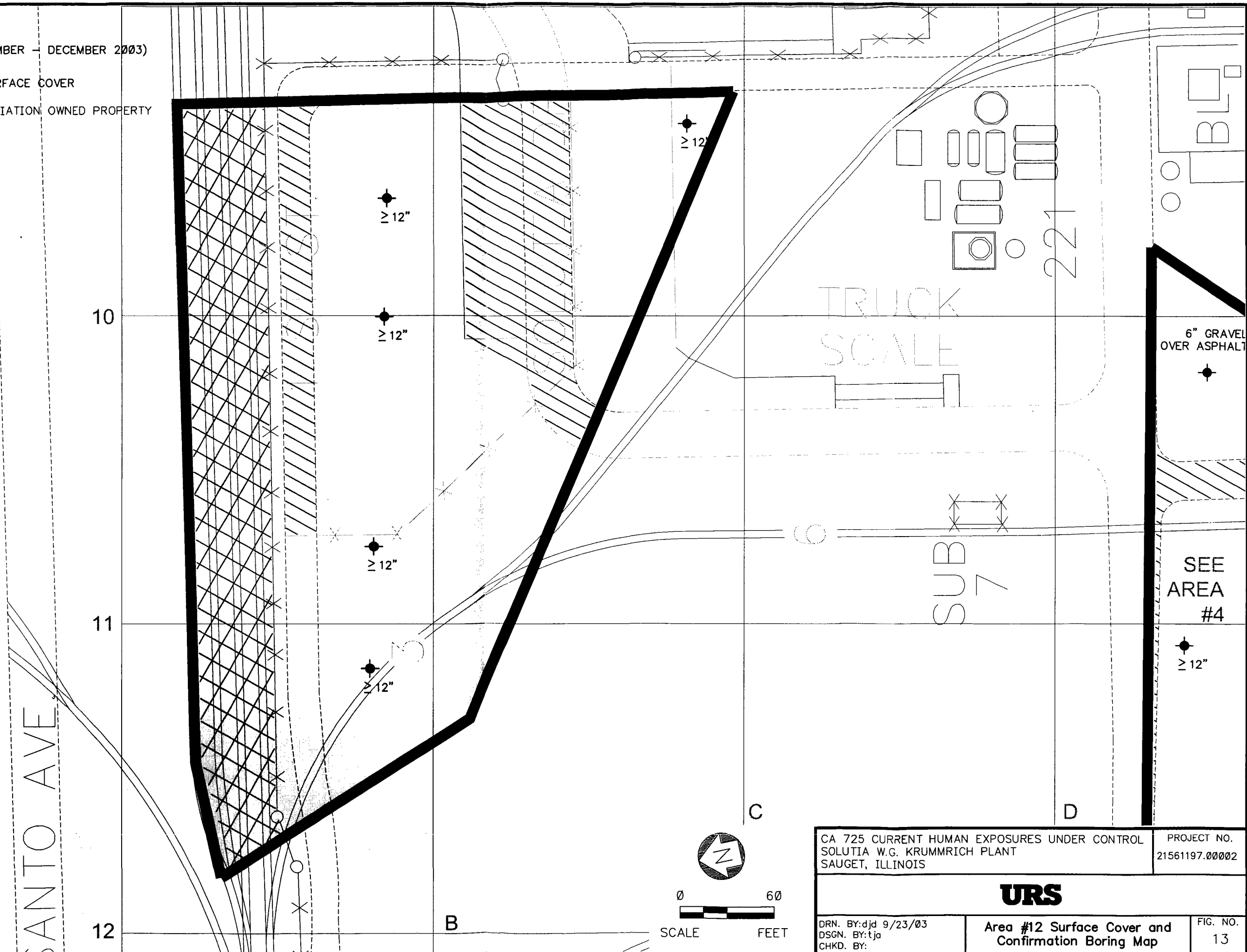
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LEGEND

- CONFIRMATION POINT (NOVEMBER - DECEMBER 2003)
- ASPHALT OR CONCRETE SURFACE COVER
- TERMINAL RAILROAD ASSOCIATION OWNED PROPERTY  
NO GRAVEL WAS ADDED



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SOLUTIA W.G. KRUMMRICH PLANT  
SAUGET, ILLINOIS

PROJECT NO.  
21561197.00002

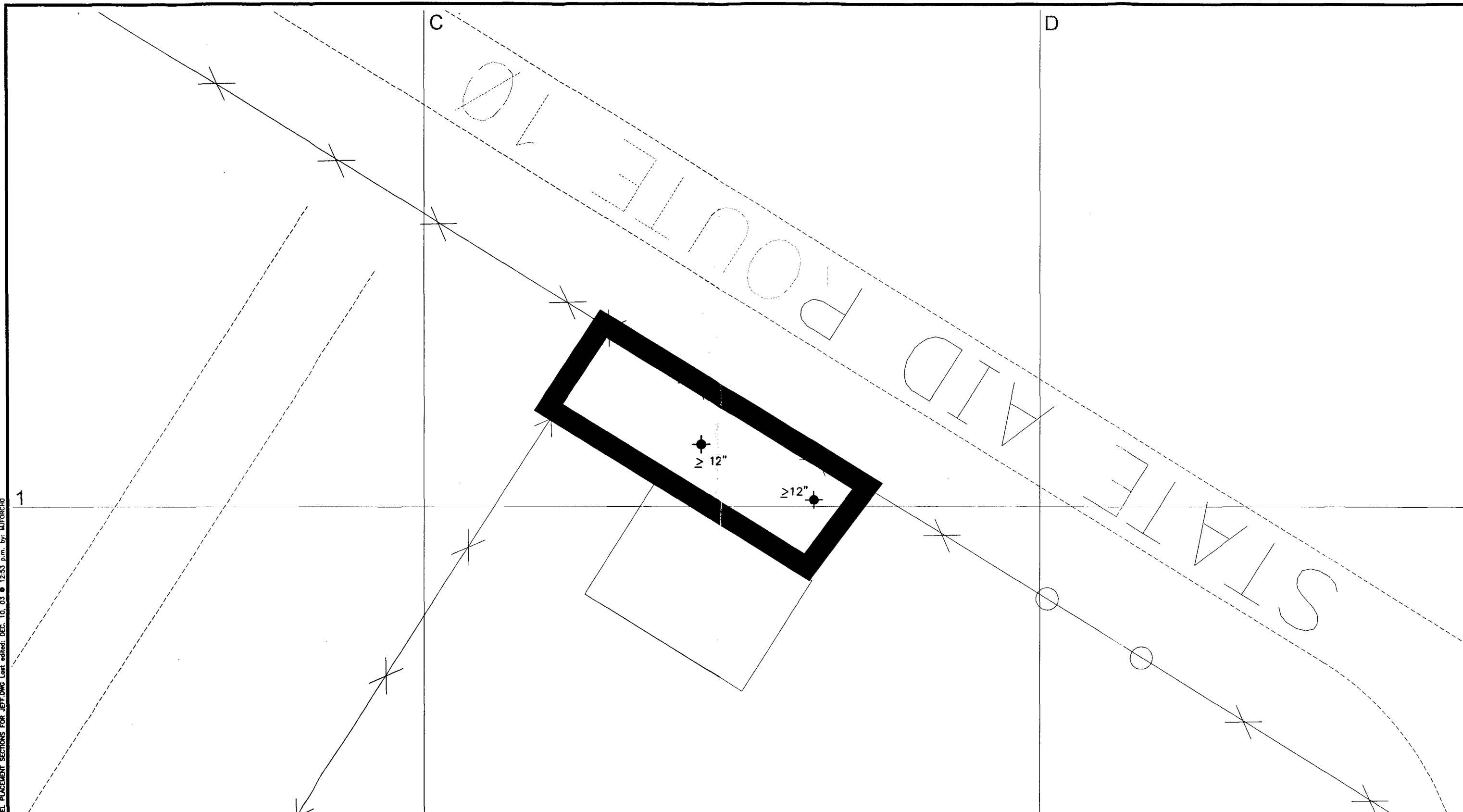
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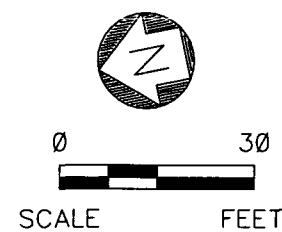
Area #12 Surface Cover and  
Confirmation Boring Map

FIG. NO.  
13

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**LEGEND**  
CONFIRMATION POINT (NOVEMBER - DECEMBER 2003)



CA 725 CURRENT HUMAN EXPOSURES UNDER CONTROL SOLUTIA W.G. KRUMMRICH PLANT SAUGET, ILLINOIS		PROJECT NO. 21561197.00002
<b>URS</b>		
DRN. BY:djd 9/23/03 DSGN. BY:tja CHKD. BY:	Area #13 Surface Cover and Confirmation Boring Map	FIG. NO. 14



Solutia W.G. Krummrich  
Gravel Addition Project  
21561197

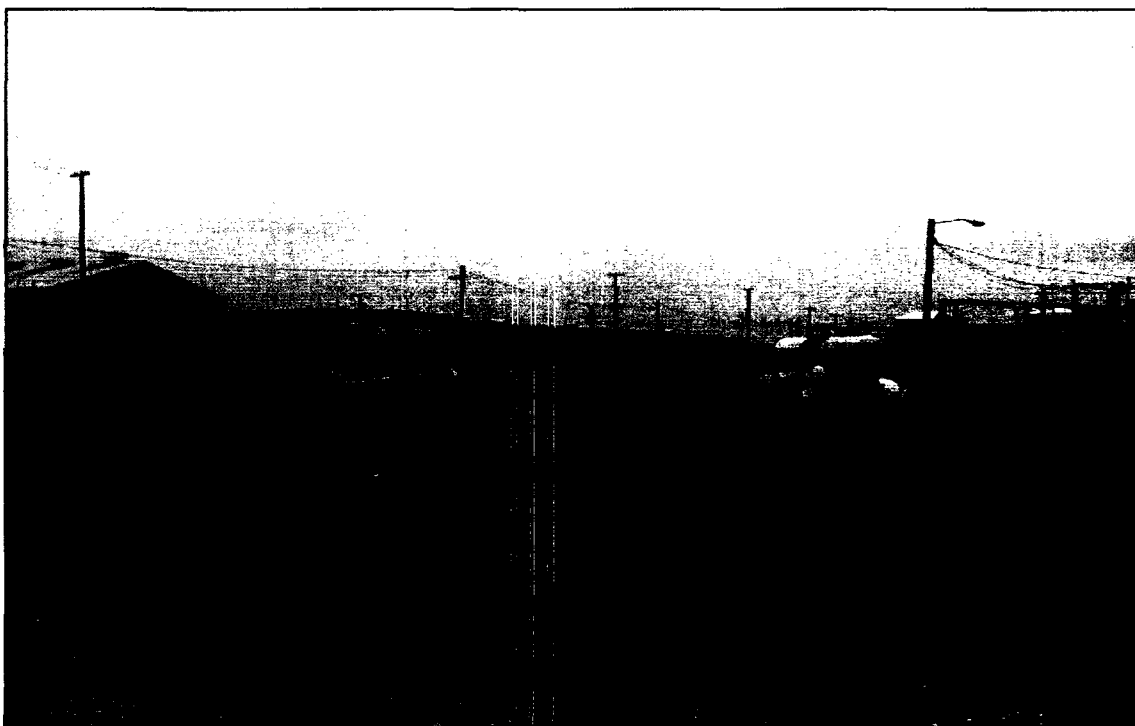


Dec-03

Area 1

Looking south at the compacted gravel between Building BBU and Route 3

Photo 1



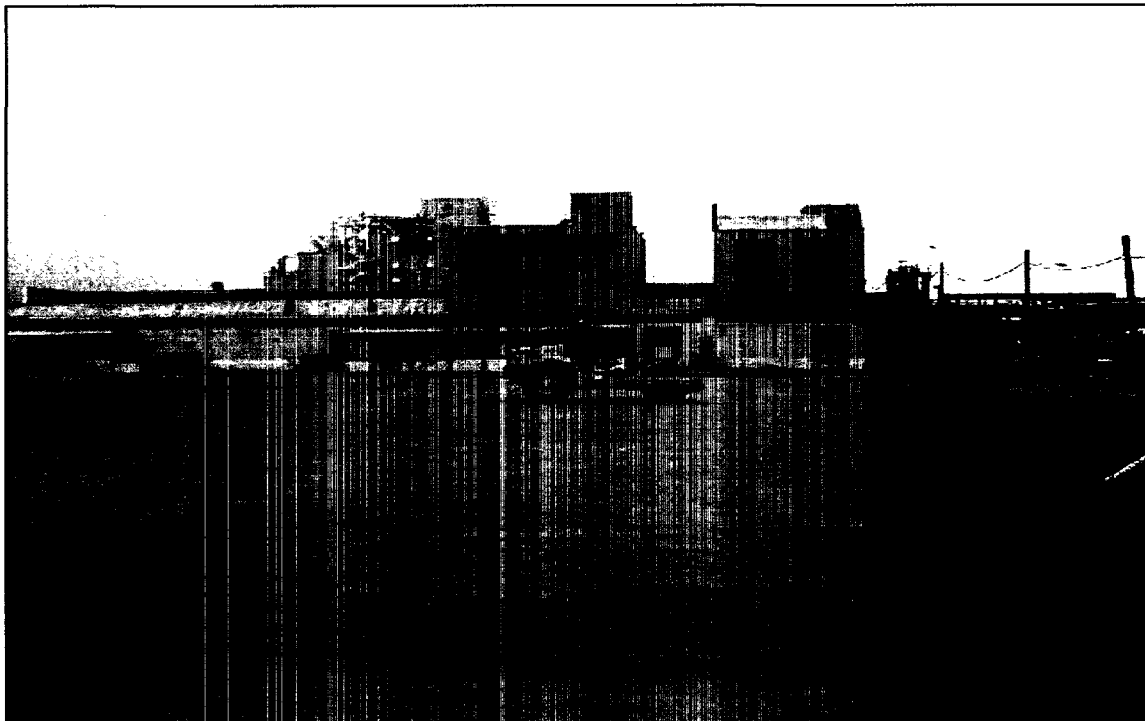
Dec-03

Area 2

Looking southwest at placed and compacted gravel in the Scrap Storage Area

Photo 2

Solutia W.G. Krummrich  
Gravel Addition Project  
21561197



Nov-03

Area 3

Photograph of gravel being compacted to the west of Building BBN

Photo 3



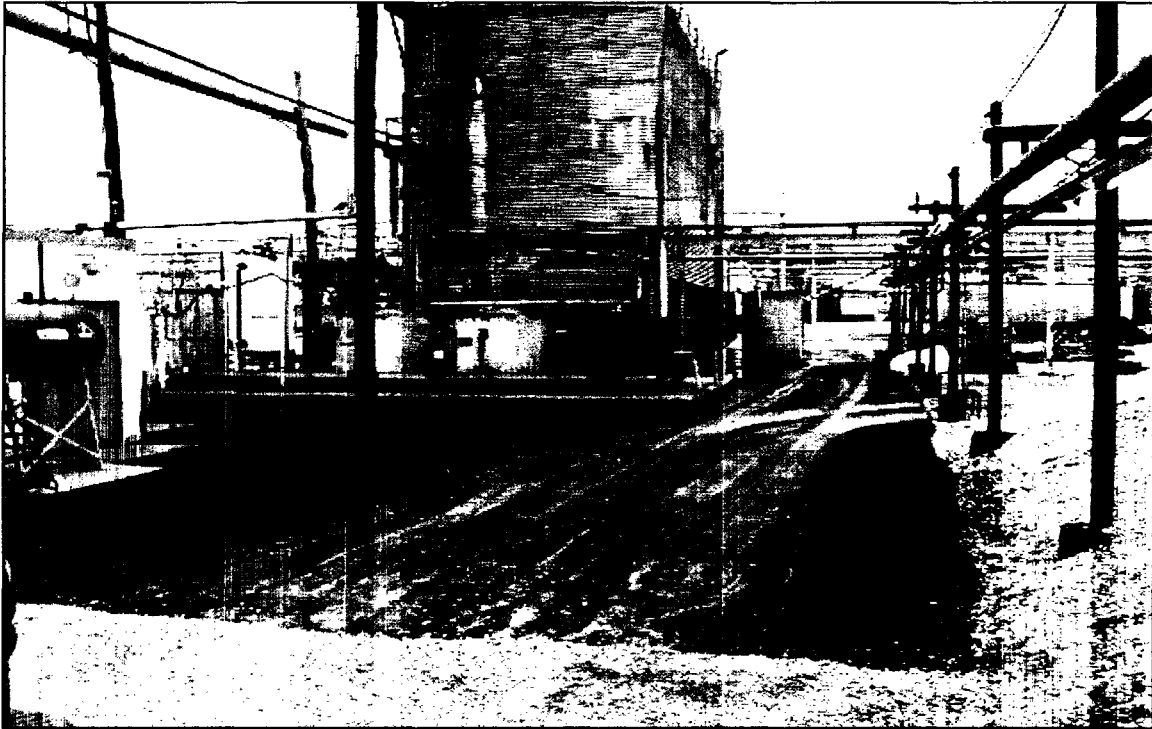
Dec-03

Area 3

Looking west at compacted gravel in the northern half of Area 3

Photo 4

Solutia W.G. Krummrich  
Gravel Addition Project  
21561197

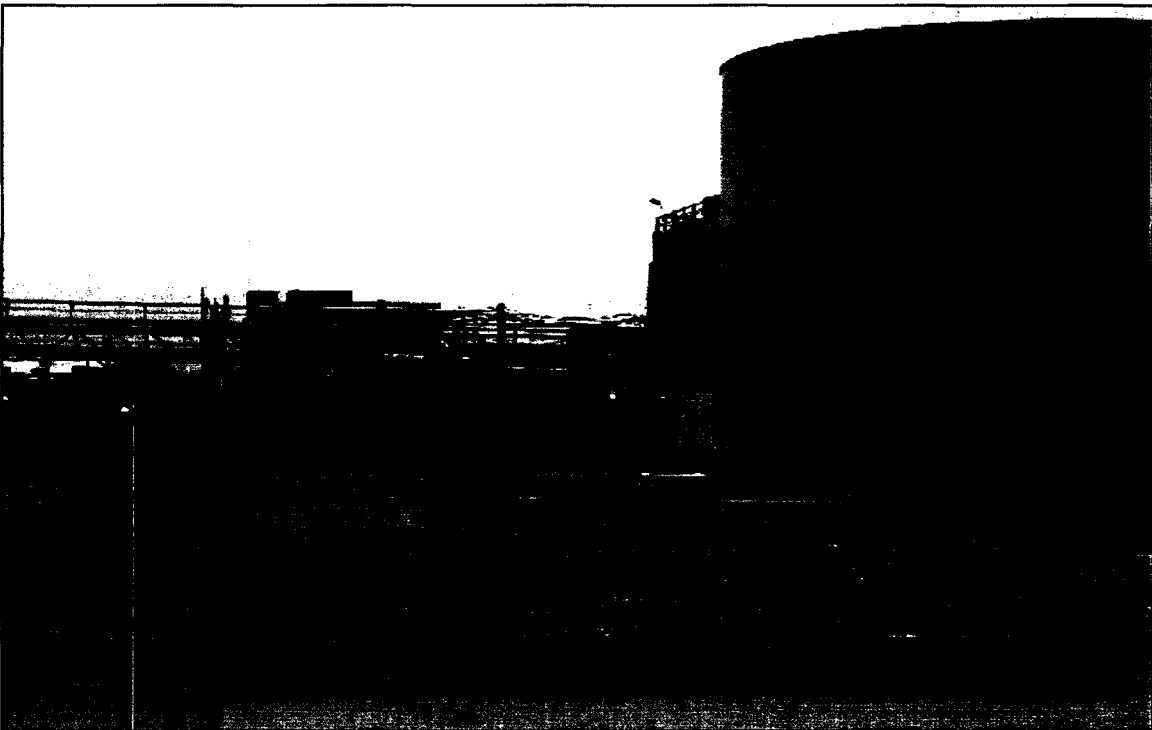


Dec-03

Area 4

Photograph looking at asphalt along the western edge of the cooling tower

Photo 5



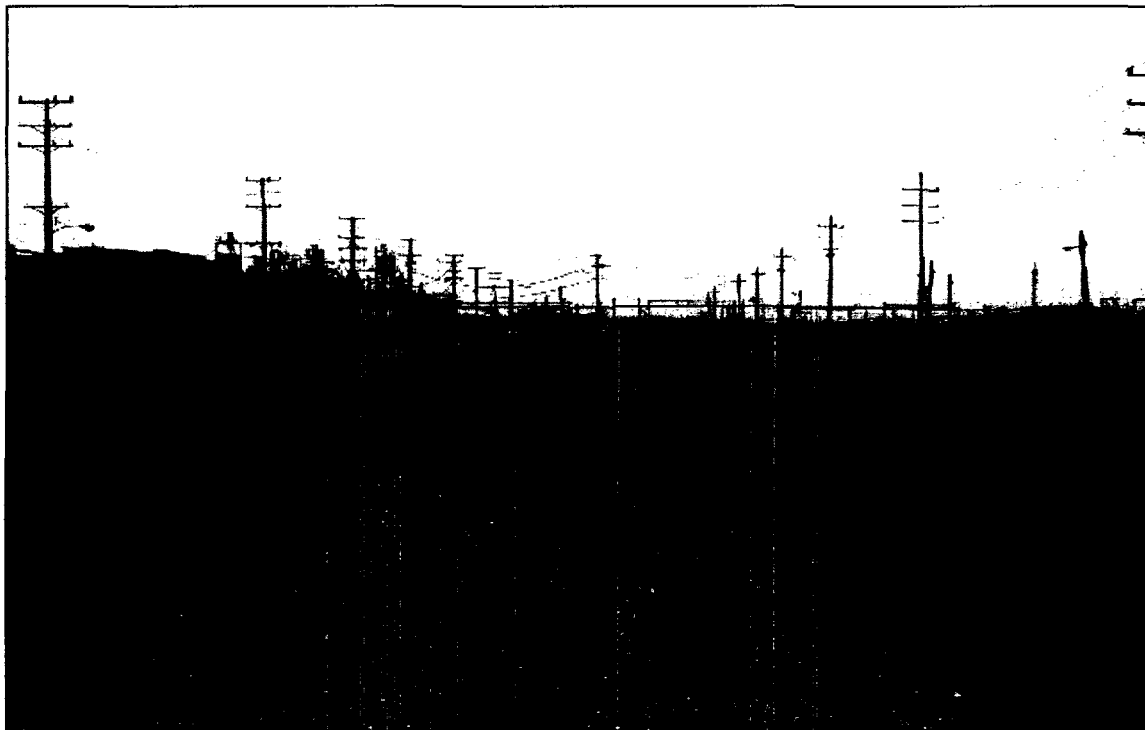
Dec-03

Area 4

Photograph of gravel located in the northern half of Area 4

Photo 6

Solutia W.G. Krummrich  
Gravel Addition Project  
21561197

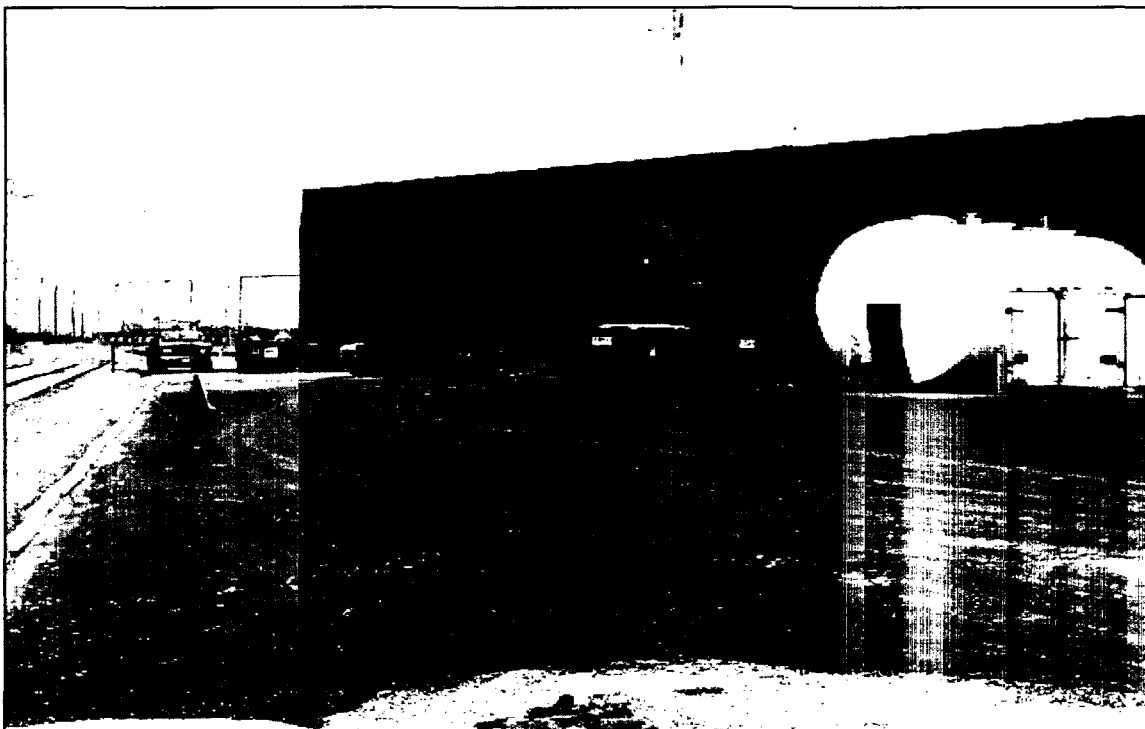


Dec-03

Area 5

Looking east at compacted gravel adjacent to Monsanto Avenue

Photo 7



Dec-03

Area 6

Photograph of asphaltic concrete to the north of the East Shop

Photo 8

Solutia W.G. Krummrich  
Gravel Addition Project  
21561197

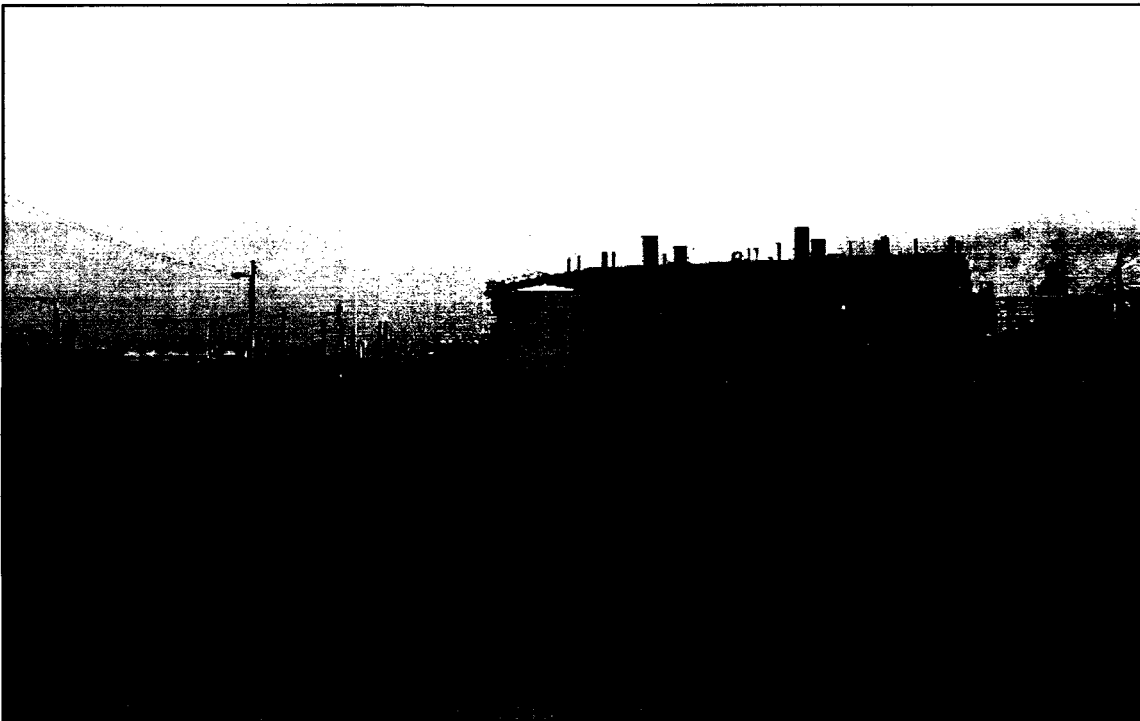


Dec-03

Area 7

Photograph of compacted limestone screening in Area 7

Photo 9



Dec-03

Area 9

Looking west at compacted limestone screenings

Photo 10

Solutia Krummrich  
Gravel Placement Project  
21561197

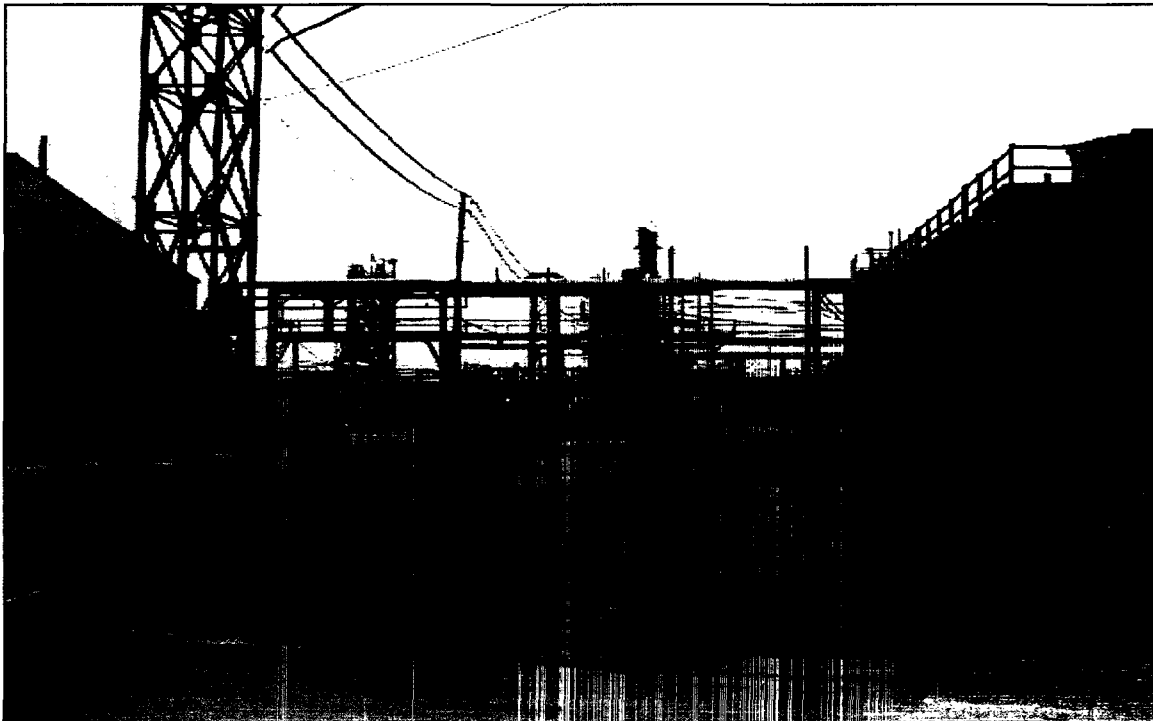


Nov-03

Area 9

Photograph of a confirmation boring being drilled in Area 9

Photo 11



Dec-03

Area 10

Looking west at screenings to the south of the cooling towers in Area 10

Photo 12

Solutia Krummrich  
Gravel Placement Project  
21561197

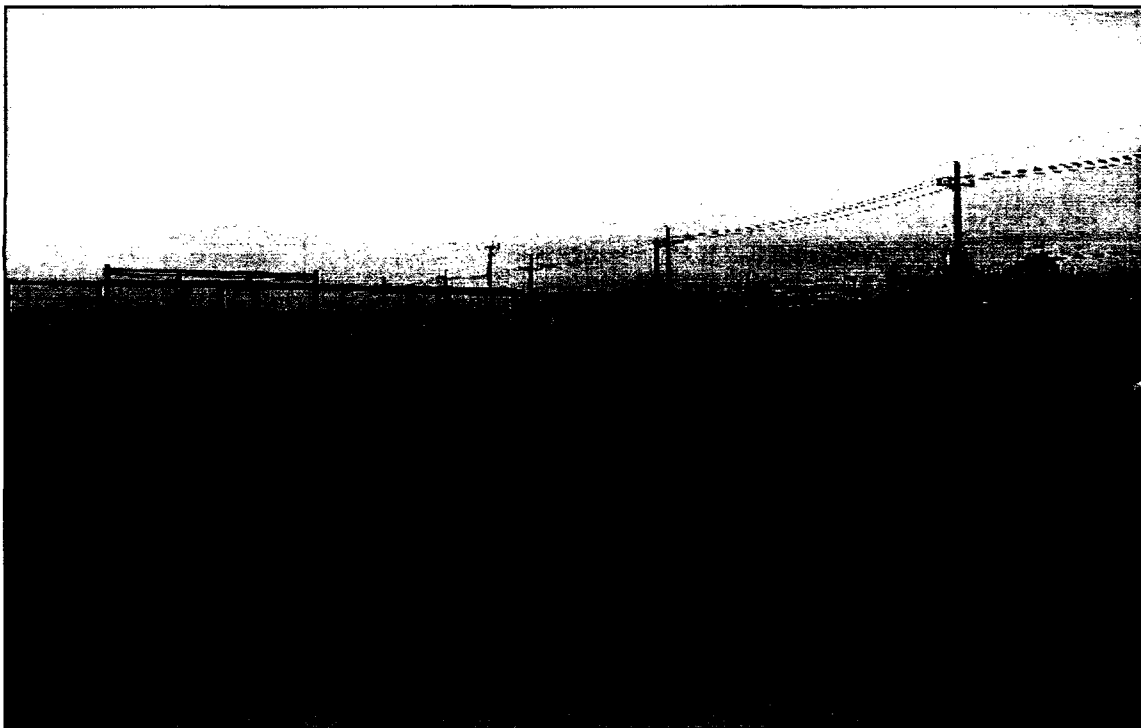


Dec-03

Area 11

Photograph of placed and stockpiled gravel in Area 11

Photo 13



Dec-03

Area 12

Looking northwest at gravel in the truck turn-around and staging areas

Photo 14